



Tennessee Valley Authority Power Facts

Fiscal Year 2001

Overall

TVA is the nation's largest public power system, producing more than 156 billion kilowatt-hours (kWh) of electricity in fiscal year (FY) 2001.

To achieve these production levels, TVA relies on an outstanding transmission system and a unique mix of fossil, hydro, nuclear, and renewable energy generation. In FY 2001, TVA fossil plants provided 64 percent of the total generation produced within the system, followed by nuclear power with 29 percent, hydro with 6 percent, and combustion turbines with 1 percent.

TVA's power system has repeatedly met tremendous demands, requiring high levels of operational excellence made possible through the dedication, skill, and ingenuity of TVA employees throughout the Valley.

In response to the terrorist attack on the United States on September 11, 2001, TVA implemented emergency response plans throughout its operations and activated its major Emergency Operations Centers. TVA has taken additional security measures to ensure public safety and the safety of TVA facilities. TVA will maintain this level of security for as long as necessary.



Fossil Power Strengths

TVA's fossil system generation of 100.1 million megawatt-hours (MWh) in 2001 is the highest FY generation on record.

Electric Light & Power, an industry magazine (November 2001), ranked Bull Run Fossil Plant 7th among the country's steam plants in heat rate, a measure of efficiency. Cumberland Fossil Plant ranked 5th in total generation among steam-electric plants across the country and 4th in production cost among the 50 largest steam-electric plants. Among these 50 large plants, Cumberland had the lowest production cost in the eastern United States.

In 2001, Cumberland Fossil Plant produced 18.97 million MWh of electricity, the most ever generated by a TVA fossil plant in a fiscal year and the most by any TVA plant for FY 2001. The plant generated 1.86 million MWh in the month of January, the most power generated by any TVA plant in a month since the early 1980s.

Allen Fossil Plant Unit 1 set a new continuous run record in 2001 of 179 days, surpassing its previous record of 165 days. This new plant record is the third consecutive run record set by Unit 1 in the last two years.

As part of TVA's continuous commitment to air quality, Selective Catalytic Reduction (SCR) systems have been installed on Paradise Units 1 and 2 to further reduce emissions of nitrogen oxide (NO_x). By 2005, TVA will have installed 18 SCR systems across its fossil system at a cost of about \$1 billion. These systems will reduce emissions of NO_x during the summer ozone season by about 75 percent, compared to levels in the mid-1990s.

TVA also will design, build, and operate five additional flue gas desulfurization systems, or scrubbers, to reduce sulfur dioxide (SO₂) emissions from its coal-fired power plants. These five scrubbers will cost approximately \$1.5 billion and will collectively reduce emissions of SO₂ by more than 200,000 tons per year, bringing TVA's total emissions down by 85 percent since 1977. Design of the scrubbers will begin in 2003.

Combustion Turbine Strengths

TVA has 64 combustion turbines at four fossil plant sites and 680 megawatts (MW) of new combustion turbine capacity that was constructed at the new Lagoon Creek site in FY 2001. An additional 680 MW will come online in time for the summer of 2002—half at the Lagoon Creek site and the remaining 340 MW at a new site in Kemper County, Mississippi. The turbines, which burn natural gas or fuel oil, cost more to operate than TVA's other power sources, but they are necessary for peak operating periods when the demand for power is high.

The combustion turbines strengthen TVA's power system and make it more flexible and reliable. They provide the ability to turn a switch and within minutes add crucial power when the power system needs it the most. To be effective, combustion turbines must start when called upon and run reliably. TVA uses Running Reliability to monitor combustion turbine startup and reliability performance. In FY 2001, Running Reliability was 96 percent out of a possible 100 percent.

Improvements at TVA's existing combustion turbines and the addition of new facilities at the Lagoon Creek site resulted in near record levels of generation for the fourth year in a row. The combined combustion turbine generation of 1.07 million MWh for FY 2001 is the second highest level generated in any FY since 1978.

Nuclear Power Strengths

World Nuclear Performance (February 2001) showed Browns Ferry Unit 2 ranked 2nd and Sequoyah Unit 2 ranked 17th of 104 reporting units in the country for the highest 1998-2000 gross capacity factor average. The gross capacity factor average is found by dividing the gross generation actually produced by a unit by the generation the unit potentially could produce. Browns Ferry Unit 2 and Sequoyah Unit 2 ranked 5th and 29th, respectively, for the 410 units reporting worldwide.

Nucleonics Week, an industry publication (July 5, 2001), ranked TVA's Sequoyah and Browns Ferry nuclear power plants as being the 2nd and 3rd, most efficient nuclear power generators in the United States in 2000. Sequoyah also ranked 2nd in the United States for having the lowest average operating costs for the three-year period of 1998-2000. Watts Bar Nuclear Power Plant received the 2001 Utility Achievement Award from the American Nuclear Society in recognition of its performance and achievements.

The Institute of Nuclear Power Operations (INPO) Index for Watts Bar Unit 1 was 99.95 percent for March 2001. With 100 percent being the highest achievable, the INPO Index is a weighted combination of performance indicators.

For the fourth time, Sequoyah Nuclear Plant set a world record for the shortest refueling outage for reactors of similar design. The Unit 2 reactor was refueled and prepared for restart in 23 days.

The Unit 1 reactor at Watts Bar Nuclear Power Plant completed a refueling outage in 27 days, which is the third shortest refueling outage on record for reactors of similar design in the United States. The Watts Bar refueling followed the unit's record 513 days of continuous operation.

Hydropower Strengths

In FY 2001, despite very low rainfall across the Tennessee Valley, TVA's 29 hydro plants and one pumped-storage plant generated over 9.5 million MWh of emissions-free electricity—enough to power 675,000 homes for a year.

TVA's hydro plants proved their reliability again in FY 2001, achieving an unplanned (or forced) outage rate of less than one percent—significantly better than the industry average of about five percent.

Raccoon Mountain, TVA's pumped-storage plant, set a new record for annual generation in FY 2001, producing almost 2.7 million MWh of electricity. This was accomplished in spite of a 120-day shutdown of one of the plant's four pump-turbines for modernization. This work increased Raccoon Mountain's generating capacity by about six percent (92 MW).

Modernization of TVA's Douglas, Fontana, Guntersville, Kentucky, and Wilson hydro plants in FY 2001 added another 90 MW of capacity to the TVA power system. A total of 750 MW will be added to the system on completion of TVA's hydro-modernization program (which includes Raccoon Mountain), scheduled for 2013.

TVA's Chickamauga, Nickajack, and Tims Ford hydro plants were automated in FY 2001. This means that TVA can now control and manage these plants—and four other hydro plants automated previously—from its Hydro Dispatch Control Center in Chattanooga. Fourteen more plants will be automated in the future, significantly reducing operating costs and increasing generating efficiency.

Two TVA hydro plants received Outstanding Stewardship of America's River's citations from the National Hydropower Association (NHA) in April 2001. NHA honored TVA for generating clean, renewable hydroelectric power while improving conditions for aquatic life in the French Broad River below its Douglas project and in the Clinch and Powell Rivers below its Norris project.

TVA was recognized by the Wildlife Habitat Council, a non-profit organization, for outstanding wildlife-habitat management at its Raccoon Mountain Pumped-Storage Plant in November 2001. The Council also recognized TVA's continued efforts to improve conditions for fish and other aquatic life in the tailwaters below its dams by increasing dissolved oxygen levels and providing minimum flows.

Green Power Switch®

TVA continued to expand Green Power Switch, the largest green power initiative in the Southeast, during FY 2001, after response to the program exceeded expectations during a year-long market test.

At the end of 2001, 4,708 residential and 214 business customers in the Tennessee Valley were buying more than 13,600 blocks of Green Power Switch. Each block represents 150 kWh of electricity.

TVA put four additional solar installations online at the American Museum of Science and Energy at Oak Ridge, Tennessee; Cocke County High School in Newport, Tennessee; Lover's Lane Soccer Complex in Bowling Green, Kentucky; and Sci-Quest in Huntsville, Alabama. This increased TVA's solar generation sites to 11 with a generating capacity of approximately 220 kilowatts. During FY 2001, TVA's solar installations produced approximately 394,200 kWh.

TVA dedicated its 2-MW Buffalo Mountain Wind Park in eastern Tennessee, the first commercial-scale use of wind power in the Southeast. The facility is capable of generating approximately 5,256,000 kWh annually.

A 2.6-MW landfill gas generation facility began commercial operation in mid-February 2001 at Middle Point Landfill in Murfreesboro, Tennessee. Methane gas, which consists mainly of methane and carbon dioxide, is produced when organic wastes in landfill sites decay. The Middle Point Landfill facility is capable of generating 16,341,780 kWh annually.

The Center for Resource Solution, which accredits TVA's Green Power Switch Program, gave permission for methane produced at the Waste Water Treatment Plant in Memphis, Tennessee, to be co-fired at TVA's Allen Fossil Plant to support Green Power Switch generation. The addition of this methane source will allow for the expansion of Green Power Switch.

Transmission System Strengths

TVA's transmission system is one of the largest single-owned and operated systems in the United States, with 17,000 miles of transmission line and 2,500 miles of optical overhead ground wire on 240,000 right-of-way acres and with 973 individual delivery and interchange points.

The system is designed to handle a maximum of about 34,000 MW. Capacity was increased in FY 2001 with the completion of 32 additional delivery points and 120 miles of transmission lines. To improve transmission system reliability and overall system performance, TVA installed six capacitor banks, replaced 500 kilovolt (kV) transformers, installed breakers at four locations, began construction of two new 500 kV substations, and replaced a broad range of other system equipment.

A new winter peak power demand was set on January 3, 2001, of 27,163 MW—almost 300 MW higher than the previous record set in December 2000. The all-time summer peak of 29,344 MW was set August 17, 2000.

During the summers of 2000 and 2001, TVA supplied 100 percent of its firm load without resorting to power interruptions or public appeals for reduced consumption. This outstanding reliability was due to excellent planning and performance of TVA's transmission system; the diversified power mix of fossil, hydro, and nuclear generation; reliable generating plants; and an array of purchased power options designed to maintain power supply reliability at the lowest possible cost.

For FY 2000 and FY 2001, TVA's transmission reliability to customers was 99.999 percent—on average three times more reliable than the utilities TVA benchmarked in the United States.

TVA is proactively working to determine how public power can be part of better regional transmission expansion and control, participating in discussions initiated by the Federal Energy Regulatory Commission (FERC) on the development of Regional Transmission Organizations (RTO).

While not subject to FERC jurisdiction, TVA is actively seeking ways of meeting FERC objectives to improve regional transmission control in a manner consistent with TVA's mission to supply affordable, reliable power to the Tennessee Valley.

TVA is moving forward with two initiatives—one, to develop a regional grid with other public power providers and two, to work with neighboring utilities and RTOs to create a network that would encourage a seamless, robust wholesale power market for much of the eastern interconnection.